TURBINE CONTROL SYSTEMS
Our Turbine Control Systems are built on the most advanced programmable controller platforms available today and these systems are designed using the latest in distributed control philosophy.

ENGINEERING & CONSULTING SERVICES
We offer industry-leading consulting, field and design services to gas turbine owners and operators worldwide as well as a wide range of services to utilities, independent power producers and private sector enterprises.

TURBINE INSTALLATION & REAPPLICATION
The relocation of a used gas turbine-generator set is very different from a new unit installation. Relocation projects are typically fast-tracked, requiring immediate equipment availability, and there is little time available for all the engineering and modification work that may be required.

GLOBAL FOOTPRINT
Turbine Technology Services has served a diverse portfolio of clients in the international power generation marketplace.

CONVERSION, MODIFICATION & UPGRADES
Turbine Technology Services can provide engineering and consulting services to include projects such as frequency conversions, fuel system conversions, emissions abatement systems, auxiliary system modification, and instrumentation and control system modification.

GAS TURBINE PARTS
Building on our reputation for engineering excellence, TTS offers an enhanced aftermarket parts service to our global customer network.
Recent Projects

Global Expertise in Turbine Engineering

Project: Turbine Upgrade & Control System Modernization
Location: Termoyopal Power Plant in Yopal, Colombia

This TTS project required the modernization of three existing and two replacement gas turbine power generation assets to enhance Termoyopal’s capabilities.

By replacing obsolete and outdated equipment at Termoyopal, as well as unsupported software platforms, TTS contributed to a significant reduction of costs related to personnel training, spare parts inventory and individual component costs. This resulted in an overall system reliability and availability improvement.

Project: Rakia LM2500 Gas Turbine Upgrade
Location: Ras al-Khaimah, United Arab Emirates

This TTS project required the upgrading of an LM2500 gas turbine in order to integrate operation with a sister unit at the Al Hamra power plant located in Ras Al Khaimah, United Arab Emirates.

The purpose of the upgrade was to provide the same capability and configuration for both units’ control systems in order to then establish a link between both unit controls systems to allow them to be operated in parallel. Upon completion of the LM2500 Upgrade, the more robust overall system improved supply reliability for all customers.

Project: Westinghouse 251B8 Turbine Control and Fuel System Conversion
Location: Diego de Almagro, Chile

This TTS project required the supply of new turbine and generator controls and complete fuel systems (from the storage tanks to the engines) for 2 – W251B8 gas turbine generators being relocated from the USA to the northern deserts of Chile.

The turbines provided for this project were supplied without control systems or fuel systems. TTS developed an open-architecture, PLC based control system for these units, ensuring expandability and flexibility of the system in this remote location. In addition, the volatility of the price of fuel in the region dictated the need for fuel flexibility. TTS developed a dual fuel system (distillate and heavy fuel oil) for the turbines, allowing the turbine to operate at varying fuel price points.

Gas Turbine Parts

Aging power plants around the world endure the wear and tear of their operation, requiring the replacement and retrofitting of the equipment to extend their technical lifetime with spare turbine parts.

Turbine Technology Services, a global leader in gas turbine engineering and consulting, has built a solid reputation in the power generation industry as a knowledgeable service provider. Building on this reputation for engineering excellence, TTS continues to offer an enhanced aftermarket parts service to our global customer network.

Our multilingual customer support team provides a total gas turbine power plant parts sourcing and procurement service. The customer support team is dedicated to providing our clients access to high quality, cost effective spare parts to support both planned and forced outages. We view this service as a key component and extension to effective asset management.

If you need inventory spares or parts in support of any maintenance activity, TTS can provide them through our extensive network of suppliers, including, but not limited to:

- GE Parts for Frame 3,5,6,7, and 9
- Westinghouse 191,251 and 501
- Ruston
- Pratt & Whitney

SERVICES INCLUDE:
- On base devices and equipment
- Pumps and Valves
- Electrical, electronic and instrumentation
- Turbine & Generator control system spares
- OEM and Non OEM systems
- Consumables
- International shipping and logistics
We Specialize

Gas turbine power plants are Turbine Technology Services’ (TTS) core business, and our team of engineering professionals has the specialized expertise and depth of knowledge to meet the demands of the power generation industry.

From troubleshooting and upgrading gas turbine systems, to relocating entire power plants at a project’s site, TTS offers specialized products and services that are tailored to our customers’ needs and designed to meet their goals and objectives.

TTS knows gas turbines and our company offers OEM alternatives that can keep your project within budget without compromising exceptional results.

We Customize

TTS can customize any of our engineering solutions to address specific goals, objectives and tasks. As a versatile engineering services provider, TTS can provide complete solutions to your project—from start to finish.

Given our longevity and experience, our engineering professionals are equipped to combine unique requirements into every aspect of the project plan. TTS and our team of engineering professionals have the experience necessary to provide solutions for any customization project.

We Optimize

TTS can perform a comprehensive evaluation of your entire operation to generate detailed recommendations for increasing output, improving heat rate, improving reliability and availability, reducing operational and maintenance costs, and enhancing the lifespan of parts.

Additionally, TTS offers combustion tuning and performance testing, allowing you to utilize one source for testing and tuning services.

GLOBAL FOOTPRINT

Turbine Technology Services’ engineers have worked for diverse companies in the industry all around the globe and bring this depth of knowledge and experience to our company to secure a strong footprint in:

- North America
- South America
- Europe
- Australia
- Asia
- Africa

TTS has the versatility and agility to provide gas turbine engineering services anywhere in the world. Our team of professionals can work with local and state governments, as well as other industry partners, in developing solutions that can get the job done on time, within budget and with efficiency.

A HISTORY OF INNOVATIVE ACHIEVEMENT

30 Years Serving the Power Generation, Process and Pipeline Community

Turbine Technology Services (TTS) is proud to celebrate 30 years of engineering excellence and industry leadership, delivering results to turbine users in the process and power generation industries.

1983 | The Beginning

Since 1983, Turbine Technology Services (TTS) has been pivotal in the gas turbine industry with high quality, cost-effective alternatives to the OEM. With more than 30 years in the gas turbine industry, TTS has offered its innovative control solutions and modernization and upgrade services to the mature gas turbine market in addition to offering a complete array of services to the industry, from state-of-the-art control components, combustion and dynamic tuning to performance testing on the latest “F” technology equipment.

1987 | Relocation

During the 1980s and 1990s TTS relocated and modernized over 40 gas turbines throughout the world. Many of these projects required 60 - 50 - 60 cycle conversions along with modernization of gas path and ancillary systems technology. TTS gave new life to neglected simple cycle gas turbines by relocating and reapplying them in combined cycle and cogen roles.

1987 | Powerlog Digital Data

First company to apply Powerlog digital data acquisition hardware and software to existing electro-pneumatic-hydraulic turbine controls.

1988 | Remote Access and Support

First company to apply remote access systems to support and troubleshoot gas turbine operational failures. Ref. ASME Extending Expertise through State-of-the-Art Monitoring.

1989 | High Speed Electronic Servo Valves

Pioneered application of high speed electronic servo valves to large gas turbine applications.

1994 | Advanced Mechanical Maintenance Methods

In its early history TTS pioneered new maintenance techniques to shave up to 50% off otherwise lengthy procedures.

1994 | Online Reference Library

In the 1990s, TTS pioneered the first comprehensive online relational reference library, known as MasterMind™. It linked the sources of all critical alarms and trips on the control screen to all documented detail and live control data related to that event.

1995 | Wearable Process/Power Plant Control

First company to create a wearable Human Machine Interface for wireless Process/Power Plant control.

1998 | Dry NOx Control Fuel Systems

In 1998 TTS, together with a leading combustion hardware developer created the first non-OEM dry low NOx type combustion system.

1998 | Remote Worldwide Access

First to provide inexpensive integration of control platforms from diverse OEMs to provide for remote worldwide access.

2002 | Bundled Tuning Services

TTS was the first to integrate combustion emissions, dynamics and controls tuning into a comprehensive service. Today, our team of experts tune OEM combustion systems to bring them into compliance. Precise fuel split and dilution hole changes are made in the field, saving days of potential down-time.

2005 | Future-Proofing for Sustainability

TTS begins applying its unique experience in gas turbine technology to retrofit hundreds of existing gas turbines to burn HFO, RFO and blends of low BTU gas fuel from coal, petroleum coke and other syngases.

2008 | Frame 7 Modifications

TTS successfully undertakes the modification of Frame 7 units for 50Hz applications.

2010 | Industry Leadership Initiatives

TTS continues to increase its industry leadership through an enhanced set of products and services, along with a brand new corporate image that reflects Turbine Technology Services’ outlook for success in the second decade of the millennium and beyond.

2011 | Triple Modular Redundancy Introduction

In response to the demand of gas turbine users to maintain the triple modular redundancy (TMR) functionality provided with their OEM gas turbine control system, TTS developed the first aftermarket Industrial Gas Turbine control system with full TMR functionality utilizing open architecture and non-proprietary, commercially available hardware.

2012 | Combustion System Auto Tuning System

TTS, a pioneer in aftermarket combustion system technology, develops an “auto tuning system” for use on advanced class gas turbines equipped with Dry Low NOx combustion system. The system automatically keeps the gas turbine operating within allowable emissions levels and in compliance with air quality permitting while protecting the combustion system from damage due to excessive wear and tear and combustion system operational excursions.
TURBINE CONTROL SYSTEMS

TTS’ Turbine Control Systems are built on the most advanced programmable controller platforms available today and each system is designed using the latest in distributed control philosophy to suit specific customer requirements.

To date, TTS’ Systems are installed on over 5200MW of generating capacity throughout the world with millions of operating hours recorded. Turbine Technology Services supplies a comprehensive package of engineering, hardware and technical support to complete a control system upgrade. This package includes overall system design; all controller and operator interface hardware, software, and installation drawings; instruction manuals; training manuals and technical direction for system commissioning.

TMS-1000 Control Systems

The TMS Series™ 1000 Turbine Control System (TMS-1000) is a digital control system designed to provide enhanced control and protection for the Gas Turbine train while maintaining the original system functionality.

TTS utilizes Rockwell Automation’s ControlLogix platform, which offers the user a high-speed, high-performance system. The controllers perform all of the sequencing, fuel control and protection that is necessary for proper gas turbine operation. The TMS-1000 system is available for use on all Heavy Duty Industrial and Aeroderivative Gas Turbine models and is intended to replace legacy analog and digital control systems.

Benefits include:
- Improving existing control system performance & reliability
- Optimizing unit output and efficiency
- Eliminating dependence on OEM for spare parts & repairs
- Reducing the cost of spare parts and/or repair
- Improving the amount of quality of information the system provides to operators and engineers
- Providing additional features to enhance unit operation and maintenance

We supply a comprehensive package of engineering, hardware, and technical support to complete the control system upgrade, which includes overall system design; all controller and operator interface hardware; software, and installation drawings; instruction manuals; and technical direction for system commissioning.

Triple Modular Redundancy

The TMS Series™ 1000 Triple Modular Redundant Turbine Control System (TMS-1000R) is a digital control system designed to provide maximum safety and system availability for the Gas Turbine train while maintaining the original system TMR functionality. TTS utilizes a Rockwell Automation/ICS Triplex Trusted™ TMR platform, which offers the user advanced fault tolerance and fail-safe features, along with high-speed and high-performance.

The processors perform all of the sequencing, fuel control and protection that is necessary for proper gas turbine operation. TMS-1000R is a replacement for any TMR control system such as the GE MKIV, V and VI systems as well as being an upgrade to the safety of any other OEM gas turbine control system.

Combining Hardware Implemented Fault Tolerance (HIFT) and TMR technology, the Trusted™ platform offers users capabilities to include Safety Integrity Level of 3 (SIL3) and fault tolerant; stable and predictable operation, high capacity and high speed; and ease of use and maintenance.

The TMS-1000R system is available for use on all Turbo Machinery Control (TMC)—compressor and gas turbine control—and it is intended to replace legacy TMR control systems.

Balance of Plant Control System Solutions

Traditionally the Gas Turbine Control System was autonomous and connected to the rest of the plant via a communications link. With the advances in communications options, I/O types and the capabilities of programmable controllers, the Gas Turbine Control System can be a fully integrated component in an overall Balance of Plant Control System (BoP). The Balance of Plant Control System uses the same controller and I/O platforms and communicates on a common bus, sharing all plant parameters.

Typical systems include, but are not limited to:
- Liquid Fuel Treatment/Forwarding/Storage
- Gas Fuel Compression
- De-mineralized Water Treatment
- Plant Instrument Air
- Plant Cooling Water Systems
- Switchgear Interface

Human Machine Interface System

The TMS 1000 HMI (Graphic Interface for the TTS TMS-1000 Control System) is available in a variety of platforms and covers numerous makes and models of gas turbines.

New Designs and Features:
- Simplified Navigation
- Descriptive Tooltips
- New Logic Controlled Analog Blocks Design with Optional Imperial/Metric Display
- TTS Developed Language Dictionary For Dual Language Applications
- Simplified Trending Selection
- Advanced Analog Data Popup

TTS offers the following HMI services:
- New HMI for our own systems
- Upgrade to existing HMI for our own systems
- Upgrades to other OEM systems - GE
TMOS-1000
TTS offers the TMOS-1000 as a replacement for existing OEM turbine and balance of plant control system HMIs on most gas and steam turbine applications. The TMOS-1000 can be connected to a Speedtronic™ control system with no modifications and little effort and completely replace an <I> or a Cimplicity® HMI. All the functions previously provided by the original machine interfaces are available via the TMOS-1000, with the additional benefit of enhanced capabilities and functions.

General Characteristics:
- Universally applicable
- Simple and effective operation
- Minimal re-training required on the new system, which is provided with comprehensive documentation
- Ease of installation of software updates
- No shutdown required resulting in short installation and integration times
- No alteration of controls or network is required
- Complete remote maintenance is possible
- Computers supplied are of high quality, reliability, and performance from leading computer manufacturers
- Widely used operating system (Microsoft Windows 2000) with simple network capabilities
- Constant development and improvement of the software increases product reliability
- Short period for realization of customer’s request
- Can be used as a gateway between other control systems and OEM controls
- Sold as a complete package, all functions are immediately available for use
- Historian included

Motor Control Center(s)
Often overlooked during system upgrades, the Gas Turbine Motor Control Center (MCC) is a key element in assuring reliability for a turbine generator package. TTS can provide either a new complete replacement MCC, or a system fully integrated into the new TMS-1000 Turbine Control System using a combination of “point I/O” and Allen Bradley’s Intellitec technology. Benefits for our new MCC include:
- Built-in DeviceNet: 8A, 600V, Class 1 cabling
- Flexible Viewing Location: Intellitec software can be run on DeviceNet, ControlNet, or EtherNet/IP
- Plug and Play - configured and tested at factory prior to shipment
- Reduced control cabling
- Increased motor running data available to operator and maintenance
- Reduced cost versus upgrading existing MCC with component replacement

CMS-1000 Combustion Dynamics Monitoring System
Dry Low NOx combustors designed to meet today’s stringent emissions regulations must operate at very lean fuel-to-air ratios in order to meet single digit NOx limits.

Operation at fuel/air ratios close to the lean flammability limit make Dry Low NOx combustors prone to dynamic pressure oscillations that can lead to accelerated wear and mechanical distress, flashback of the flame into the premixer, or lean blow out trips.

Regular tuning of these systems is required to ensure compliance with emission regulations and long term component integrity. TTS’ CMS-1000 CDMS is specifically tailored for measuring dynamic pressure pulsations in gas turbine Dry Low NOx applications. Hardware configuration and setup are simple, and the software is user-friendly and provides data in formats that Dry Low NOx tuners and operators need to easily optimize their operation.

This system is available in two configurations: CDMS portable system and CDMS permanently installed system.

ElectroFlo® Electronic Control Valve
Fast and accurate flow control for combustion turbine applications is more accessible with the ElectroFlo® Electronic Control Valve. Developed by TTS, the ElectroFlo® Valve surpasses the response and accuracy of most pneumatic and high pressure hydraulic systems, while eliminating many of the complications associated with each.

With the ElectroFlo® Valve and other suggested modifications, TTS can completely eliminate all hydraulic and pneumatic accessories found on typical gas turbines. The ElectroFlo® Valve has over 10 million installed hours in applications controlling fluids from natural gas and diesel fuel to steam and water for NOx abatement.

Using TTS’ ElectroFlo® valve offers the potential to make the turbine operation more reliable by eliminating pneumatic and hydraulic systems and components which are prone to failure.

We Know Gas Turbines
TTS is at the forefront of power generation innovation, providing expertise and knowledge to enhance and extend turbine equipment’s lifetime and performance.
Consulting and Design Services
TTS offers industry-leading consulting, field and design services to gas turbine owners and operators worldwide as well as a wide range of services to utilities, independent power producers and private sector enterprises. Our engineering consultants deliver proactive evaluation and solutions for gas turbine owners and operators. TTS field engineers focus on implementing our effective designs, providing thorough evaluations, supervising contractors and suppliers, and coordinating all plant interfaces.

Project Management
TTS takes a “systems approach” to every project we manage. Our engineers can combine gas turbine enhancements into one comprehensive package. Each of our project managers brings a strong combination of experience and specialization to every major project. TTS is a proven alternative for turnkey relocation and installation projects, and our project management teams will cover all of the following aspects of a project:

- Design Engineering
- Field Engineering
- Logistic Planning
- Performance/NOx Testing/NOx Tuning
- Craft Labor/Technicians
- Emissions Compliance
- Equipment Installations
- Material Acquisition

Technical Direction
When it comes to overall gas turbine knowledge and experience, TTS is an industry leader in after market gas turbine support. Our technical directors have an extensive knowledge in mechanical, electrical, controls and support systems for many gas turbine manufacturers and models from the mature fleet to the most advanced models. We provide a completely integrated and tested maintenance solution for our customers.

Troubleshooting and Maintenance
Don’t leave troubleshooting and maintenance to the inexperienced. TTS has 30 years of experience in supporting gas turbine users worldwide and our engineers have decades of experience on many OEM platforms. We can begin to support your troubleshooting or maintenance activity immediately.

Start-Up Commissioning Services
Whether it is a new plant start-up, unit relocation or post maintenance activity, Turbine Technology Services can provide the expertise required to commission your gas turbine and driven equipment. TTS can provide qualified commissioning engineers experienced in:

- Gas Turbine Control Systems
- Gas Turbine Mechanical Systems
- Generator Control, Protection & Excitation Systems
- Process and BoP Systems
- Electrical Systems – LV, MV and HV

TTS also provides back office engineering support to quickly and effectively answer any issues that arise during commissioning activities. Through this combined expertise – on site and in the office – TTS is able to offer our clients fast, efficient, cost effective and most importantly safe start up of their assets.

Combustion Dynamics & Emissions Tuning
For Dry Low NOx combustion systems, combustion dynamics tuning is required during initial unit start-up and periodically thereafter any time combustion or hot gas path hardware is changed out. Additionally, combustion dynamics tuning may be required to help meet your goals for operational flexibility.

Combustion dynamics tuning involves the acquisition and analysis of real-time dynamics data using locally installed equipment and adjustment of a gas turbine’s operating configuration. Tuning minimizes emissions and combustion hardware stress levels.

Monitoring services allow real-time analysis of combustion dynamics, identification of changes to a unit’s operating profile and recommendations for corrective tuning. Customers benefit from improved reliability, availability and regulatory emissions compliance as a result of combustion dynamics tuning.

Comprehensive Dry Low NOx Services:
- Dry Low NOx Tuning
- Auto Tuning
- Operational Troubleshooting
- Maximize Load Turndown
- Training

Comprehensive Performance Optimization:
- Improved Output and Efficiency
- Cold Weather Optimization

We Know Gas Turbines
TTS’ projects have been featured in a variety of industry publications, including POWER Magazine, Cogeneration and On-Site Power Production Magazine and numerous other global turbine engineering publications and journals.

TTS is trusted by governments and private industry customers alike—and our reputation in global power engineering is why we continue to excel and succeed.

Our global footprint covers some of the most remote locations in the world, where power equals opportunity and prosperity for the people, companies and communities that depend on reliable energy generation.
Unit Performance Optimization Programs

Turbine Technology Services’ experience and expertise in the optimization of gas turbines offers exceptional benefits for your power generation facility. Gas turbine performance optimization is a process where control systems are improved to minimize fuel consumption while maintaining optimal unit output.

TTS’ knowledge of gas turbines uniquely positions Turbine Technology Services to become your optimization partner and help you enhance your power generation system. Our unit performance optimization programs protect and optimize the performance of your gas turbine, the most expensive and important element in a power plant.

Remote Access Support

Turbine Technology Services lets you access and monitor turbine control data and applications from anywhere in the world for added redundancy and flexibility. Our remote support service also allows our global network of turbine specialists to remotely monitor and troubleshoot your turbine problems, and/or to make controls modifications from our offices in Orlando, Florida or any other location with ground or satellite internet access.

During commissioning and troubleshooting this remote “knowledge network” supplements the expertise of our on-site staff to provide enhanced problem review and diagnosis, resulting in faster turnaround times, shorter outages, and time and money savings. All remote support connections use high level encryption and will follow your corporate protocol ensuring all data is secure and access is controlled. TTS’ Remote Access Support can help manage the cost of field service work with a more attractive cost option and with the same level of expertise you expect from our engineers.

TURBINE INSTALLATION AND REAPPLICATION SERVICES

No matter where a turbine is located or where its final destination may be, Turbine Technology Services is ready to install and reapply it quickly and efficiently.

The relocation of a used gas turbine-generator set is very different from a new unit installation. Relocation projects are typically fast-tracked, requiring immediate equipment availability, and there is little time available for all the engineering and modification work that may be required.

Turbine Technology Services can support your turbine installation and reapplication needs anywhere in the world, offering a complete package of services to ensure that your capital investment is well taken care of before, during and after its reapplication.

TTS is uniquely positioned with the knowledge and expertise required for successful relocation projects, and our engineering team has the specialized skill set to provide a complete solution.

- Original Plant Disassembly
- Transportation and Logistics
- New Plant Layout Engineering
- Fuel Conversions
- Frequency Conversions
- Electrical One-Line and Protection Engineering
- Emissions Control and Compliance
- Equipment Upgrades and Modifications

Relocation & Reapplication Service Projects

9 Frame 6 Power Barges

TTS was the EPC contractor for the relocation of these units from the Philippines to Nigeria. In addition to the basic relocation and commissioning work, the project also required 60/50Hz frequency conversions, fuel system conversions, emissions controls equipment, demin-water plants and new control systems. The project was completed ahead of schedule.

8 Frame 7B Turbine-Generators

TTS provided extensive technical direction and project management for the relocation of these units from South Korea to sites in the USA. In addition to project supervision, TTS was also the overhaul and upgrade contractors for much of the work required to convert them from 7B/liquid fuel configuration, to 7E/gas fuel/low NOx combustor design. The first of these projects was completed in eight months—from South Korea disassembly to USA operation.

4 Frame 7EA Turbine Generator Sets

In 2009, TTS made history by being the first company to engineer and install Frame 7EA turbine–generators in a 50Hz country (Kuwait). The commissioning of the units required a long and complex engineering process, much of which had to be performed at the site in Kuwait. The frequency conversion required the addition of a gearbox and auxiliaries, generator modifications, plant layout engineering, generator design and protection, plant electrical design, diesel starting systems, modifications to all on-base auxiliaries, and controls engineering.

This project was showcased on the November-December 2010 issue of Cogeneration & On-Site Power Production magazine—including the diverse modifications and upgrades on the power plant’s gearbox and auxiliary lube oil module, starting motors and auxiliaries, fuel system conversion, BoP engineering, plant-wide control systems and state-of-the-art central control room.
CONVERSION, MODIFICATION AND UPGRADE SERVICES
Reducing Operational Cost Through Modernization

Turbine Technology Services can provide engineering and consulting services for a wide range of projects including frequency conversions, fuel system conversions, emissions abatement systems, auxiliary system modification, instrumentation and control system modification. The benefits of modernizing or upgrading a gas turbine can lead to improved component durability, reducing the need to replace or recondition parts and components. The result of the upgrade or modernization efforts can also lead to a reduction in the cost of maintaining the power plant.

Frequency Conversions

Frequency conversions are required when a unit is relocated from a 50Hz system to a 60Hz system or vice versa. TTS has undertaken numerous frequency conversions on a variety of units, the most complex of which was a recent reapplication project of 4 direct drive 60Hz GE Frame 7EA units to a 50Hz location in the Middle East. When undertaking a frequency conversion project, TTS considers and reviews a range of items, including:

• All AC Motors and associated driven equipment
• Load Gear modification or installation requirement
• Generator design limitations
• Generator excitation and protection requirements
• Control system requirements
• BoP requirements

TTS has the technical resources and expertise to manage all of these areas and make certain that each is addressed correctly to ensure optimum operation of the unit in its new location.

Fuel System Conversions

In today’s demanding power generation markets, fuel cost and availability have become critical items for most gas turbine users. As such, the ability to switch fuels has become an important competitive advantage. TTS has extensive experience in the provision of complete fuel conversions for gas turbine units, allowing users to consider a variety of options, including:

• Liquid to gas or gas to liquid fuel
• Single liquid or gas fuel to dual fuel on gas and liquid
• Dual liquid or dual gas
• Conversion to Dry Low NOx
• Conversion to HFO or Residual Fuel
• Conversion to Naphtha
• Conversion to non-standard or low-BTU gas

TTS can undertake an entire fuel conversion project in all of these scenarios, including using our gas turbine expertise in making diverse hardware and software system modifications required on the existing control systems.

Auxiliary System Modification

On older gas turbines, many of the original auxiliary systems have become obsolete and difficult to maintain. In addition, better versions of these systems have been developed and new systems, which further benefit the unit, have been designed. TTS can provide and install a range of auxiliary system modifications, which are fully engineered for your unit, including:

• Pneumatic or Hydraulic Fuel Valve Replacement
• Ratchet Upgrades
• Quick Restart Systems
• Pneumatic System Modifications (PS&G Panels)
• Inlet Misting
• Inlet Cooling
• Starting Means Modifications
• Atomizing Air Modifications
• Flow Divider Modifications
• Compartment Cooling Modifications

If you currently have problems with existing auxiliary systems or wish to add an additional system, contact us to request a review of your unit and we will provide the optimum solution for your requirement.

Emissions Abatement Systems

As the international community transitions into a Green Economy driven by sustainable engineering practices, concern for environmental optimization is prompting governments throughout the world to require gas turbine users to reduce NOx emissions from their units. Environmental requirements can vary from country to country and even site to site within a country. The most cost effective systems will depend on many factors including available resources and governmental regulations.

TTS has extensive experience in the provision of complete emission abatement systems for gas turbine users including both “wet” and “dry” systems. TTS can work with each customer to analyze their required NOx levels and the cost of each potential NOx reduction approach to identify the most cost effective system for each individual case. In addition, we can also provide NOx emission calculations for each of the possible cases to assure the compliance of the system before its installation.

Once the optimum solution has been identified, TTS can undertake the entire conversion including all required hardware and the software system modifications required on the existing control systems or the provision of new systems as necessary.

Instrumentation and Control System Modifications

In addition to providing complete control system upgrades with the Turbine Management System (TMS) range of products, TTS can provide support and replacement components on a number of existing control systems and sub-systems, including:

• GE Speedtronic™ System DOS replacement
• GE Speedtronic™ System DOS upgrades to Cimplicity™ HMI equivalent
• GE Speedtronic™ System Cimplicity™<HMI > replacement
• GE Speedtronic™ Mark I, Mark II, Mark IV, Mark V, and Mark VI engineering and modifications, including parts as required
• WDPF engineering and modifications, including parts as required
• On base transmitter and device upgrades
• TTS HMI upgrades
BARGE MOUNTED POWER PLANTS

Barge mounted power plants have always been a popular alternative to land based plants because they can be moved quickly to meet power supply needs. Quality relocation services are necessary for barge mounted power plants to be transported and fulfill areas of need with safety and efficiency.

The relocation of barge mounted power plants is a complex process in which sound planning and engineering are necessary. Along with experience in the basic relocation work, the ability to provide commissioning and supplemental installation services is critical to the success of any relocation.

A global leader in engineering consulting, Turbine Technology Services has a strong reputation in relocating multiple barge mounted power units ahead of schedule. TTS can provide any or all of its engineering, procurement, project management, commissioning and construction services to ensure a successful barge reapplication.

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